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**(54) Board mounted shielded electrical connector**

Leiterplattenmontierter, abgeschirmter elektrischer Verbinder

Connecteur électrique blindé monté sur plaque de circuits

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**US-A- 4 889 502**                   **US-A- 4 943 244**

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**Description**

The present invention relates to an electrical connector, and more particularly, to a shielded electrical connector for mounting on a printed circuit board and for attachment to a complementary electrical connector.

Right angle D-faced electrical connectors are used in the electronics industry as an input/output (I/O) device to interconnect a computer to external peripheral equipment. The contacts of the electrical connector are typically soldered to conductive traces on a printed circuit board at a back wall or panel of the computer. A conductive shell surrounding the contacts in the housing of the connector is frequently used as a shield to protect against electromagnetic or radio frequency interference (EMI/RFI). A conductive locking clip is often used to retain the connector on the printed circuit board for soldering the contacts by a conventional wave soldering process. The locking clip further serves as a means to connect a ground trace on the printed circuit board to the conductive shell of the connector. The front face of the connector, in addition to having the D-face for polarization, typically includes latching structure for mating with a complementary electrical connector which is attached to the peripheral equipment.

With respect to such latching structure, as disclosed in U.S. Patent 4,808,125 (Waters, et al), due to the prospect of repeated mating and unmating of the right angle D-connector to the complementary connector, it is preferable that the latches on the connector be formed of metal, such as a cast metal, rather than plastic which may be susceptible to failures. In the Waters, et al patent, not only the latches, but the entire connector housing is integrally formed of a cast metal, thus complicating the shielding of the electrical contacts in the connector. Individual metal latching blocks, for example, as disclosed in U.S.-A- 4,506,937 (Cosmos, et al) are also used for attachment to a mating complementary connector. U.S. -A-4,506,937 discloses a shielded electrical connector for mounting on a printed circuit board and for attachment to a complementary electrical connector. The connector comprises an insulator of insulative material including a body and two spaced ear portions, each ear portion projecting outwardly from the body and comprising a mounting wall and a base, the body having a plurality of apertures therein supporting a respective plurality of electrical contacts. A conductive shell is supported on the insulator body and comprises two spaced flanges, each flange having a surface disposed adjacent a respective insulator mounting wall. Two one-piece, metal latching blocks separate from the conductive shell are provided, each block being disposed against a respective flange of the shell. While individual latching blocks may be more cost effective and less complicated than a one-piece housing with latches, attention must be provided in securing the latching blocks to the connector in a manner that would properly align its latches and prevent rotation thereof so that attachment to the

complementary connector may be properly made.

As to the locking clip that is used as a ground commoning element and as a means to retain the connector to a printed circuit board during contact soldering, such a clip is shown, for example, in U.S. Patent 4,721,473 (DelGuidice, et al). It is noted by DelGuidice, et al that alignment of the connector on the printed circuit board is desirable in order to properly interconnect to the mating complementary connector without placing undue stress on the circuit board connections. In this regard, the locking clip typically includes resiliently deformable legs that are fictionally received in openings in a printed circuit board. Due to the resistive force accompanying the insertion of the resilient legs into the board openings, it is desirable to prevent the locking clip from experiencing excessive bending that would result in misaligned or improper mounting of the connector to the printed circuit board.

Another and similar board mounted shielded electrical connector is described in US-A-4 943 244.

It is an object of the present invention to provide an improved shielded electrical connector.

It is a further object of the present invention to provide a shielded electrical connector having an improved latching block for attachment to a complementary electrical connector and an improved locking clip for mounting on a printed circuit board.

In accordance with the invention, there is provided a shielded electrical connector for mounting on a printed circuit board and for attachment to a complementary electrical connector, comprising:

an insulator of insulative material including a body and two spaced ear portions, each ear portion projecting outwardly from said body and comprising a mounting wall having an opening therethrough and a base, said body having a plurality of apertures therein supporting a respective plurality of electrical contacts;

a conductive shell supported on said insulator body and comprising two spaced flanges, each flange having a surface disposed adjacent a respective insulator mounting wall and having an opening therethrough in substantial registry with a respective opening in said insulator mounting wall;

two one-piece, metal latching blocks separate from said conductive shell for attachment to a complementary electrical connector, each block being disposed against a respective flange of said shell, each block comprising a generally flat plate having opposed surfaces, a latching member projecting outwardly from one of said surfaces and in a direction away from said shell flange, and a bushing projecting from said opposite plate surface, said bushing extending through said opening in said shell flange and through said opening in said ear portion mounting wall, said bushing having an internally threaded aperture opening through said surfaces of

said flat plate, each said block including a keying element projecting toward a respective ear portion mounting wall and being in engagement therewith, said keying element aligning each block relative to said shell flange and providing anti-rotation resistance, said keying element being spaced from said bushing and lying within the periphery of said mounting wall; and  
 two conductive locking clips supported by said insulator bases, each clip having a securement portion secured to a respective bushing and a resilient latching portion projecting outwardly from said base for resilient mounting to an electrical circuit on a printed circuit board.

The invention further provides a one-piece, metal latching block for use with a separate latching block on an electrical connector for attachment to a complementary electrical connector, comprising:

a generally flat plate having opposed surfaces, a latching member projecting outwardly from one of said surfaces,  
 a bushing projecting outwardly from said opposite surface, said bushing having an internally threaded aperture opening through said surfaces of said flat plate;  
 at least one keying element projecting outwardly from said opposite surface and being spaced from said bushing, such keying element comprising a keying surface lying within the periphery of said flat plate.

By way of example, one embodiment of a connector and one embodiment of a latching block according to the invention will now be described with reference to the accompanying drawings, in which:-

Figure 1 is an exploded, top perspective view of a shielded electrical connector in accordance with a preferred embodiment of the invention.

Figure 2 is a front, perspective view of a one-piece, latching block for particular use in the electrical connector of Figure 1. Figure 3 is a rear, perspective view of the latching block illustrated in Figure 2.

Figure 4 is a rear elevation view of the latching block of Figure 3.

Figure 5 is a cross-sectional view of the latching block of Figure 4 as seen along viewing lines V-V.

Figure 6 is a rear, perspective view of a locking clip for particular use in the electrical connector of Figure 1.

Figure 7 is a rear perspective view of a fragmentary portion of the electrical connector of Figure 1, showing details of the connector insulator base on which the locking clip of Figure 6 is secured.

Turning now to the drawing figures, there is shown in Figure 1 a right angle D-faced shielded electrical connector 10 for mounting on a printed circuit board and for attachment to a complementary electrical connector.

Connector 10 basically comprises an insulator 12, a conductive shell 14, a pair of metal one-piece latching blocks 16, a pair of conductive locking clips 18 and a plurality of right angle electrical contacts 20.

The insulator 12 is formed of insulative material, preferably being a molded thermo-plastic material and comprises a generally elongate body 22. Projecting outwardly from the front surface of the body 22 is a nose portion 24 configured in the industry standard D-configuration for polarization purposes. Extending through the nose portion and the insulator body 22 are a plurality of apertures 26 which open through the front surface and the rear surface (not shown) of the body 22. In the arrangement shown, there are two rows of 25 apertures each, each aperture being spaced 0.05 inch within a row, and the upper and lower row being spaced 0.100 inch. It should be appreciated that different numbers of apertures at different spacings may also be used within the context of the invention. The electrical contacts 20, each having a right-angle bend, are received respectively in the apertures 26 and are supported in the insulator body 22. The contacts 20 each include a terminal pin 28 for receipt in openings in a printed circuit board (not shown) for subsequent soldering thereto so as to electrically interconnect the connector 10 to electrical circuits on the printed circuit board.

Insulator 12 includes a pair of ear portions 30 projecting outwardly from the respective ends of the body 22. Each ear portion 30 comprises a generally planar mounting wall 32 defined by an upper edge 34 and a lower edge 36 that are substantially parallel to each other and an interconnecting outer edge 38 that is substantially perpendicular to the upper and lower edges respectively. Extending into the upper edge 34 is a curved recess 40 and extending into the lower edge 36 is a similarly configured curved recess 42. The upper recess 40 and the lower recess 42 are preferably aligned with each other in a plane generally parallel to the outer edge 38. As will be described hereinafter, recesses 40 and 42 provide keyways for keying the latching block 16 upon assembly of the blocks 16 to the insulator 12. Extending through the mounting wall 32 of each ear portion 30 is an opening 44. In the preferred arrangement, the recesses 40 and 42 are aligned closer to the body 22 than is the central axis of the opening 44. Each ear portion further includes a base 46 extending rearwardly from a respective mounting wall 32, each base 46 having an opening 48 therethrough for retentive receipt of a respective locking clip 18 therein.

Referring still to Figure 1, the conductive shell 14 comprises a generally elongate, planar frame 50. Projecting outwardly from the ends of the frame 50 is a pair of generally planar flanges 52, each of the flanges being substantially parallel to the frame 50 and being offset rearwardly with respect to the frame 50 by a spacing, s. Extending outwardly from the front of the frame 50 is a continuous nose section 54 configured in complementary form to the D-shape nose portion 24 and adapted

form surrounding receipt thereon.

Each flange 52 is defined by an upper edge 56 and a lower edge 58 that are substantially parallel and an outer edge 60 that joins the upper and lower edges 56, 58 and is substantially perpendicular thereto. A curved upper recess 62 extends into the upper shell edge 56 and a lower curved recess 64 extends into the lower shell edge 58. An opening 66 extends through each flange 52. Upon attachment of the shell 14 to the insulator 12, the flanges 52 are formed to lie against the respective ear portions 32, the flange recesses 62 and 64 being formed to lie in substantial registry with the recesses 40 and 42 in the mounting wall, and the flange opening 66 to lie in substantial registry with the opening 44 in the mounting wall. In the preferred embodiment, the shell 14 is a drawn steel shell which provides protection against electro-magnetic interference (EMI) and radio frequency interference (RFI) for the contacts supported in the insulator 12. Further, as will be described, the shell 14 may be electrically commoned to a ground trace on a printed circuit board by the conductive locking clips 18.

Turning now also to Figures 2 through 5, the details of the latching block in accordance with a preferred form of the invention may be more fully understood. Each block 16 is formed as an integral, one-piece block of metal, preferably a die-cast metal, such as zinc. Each block comprises a substantially flat plate 68 including a front planar surface 70 and a rear planar surface 72. Each flat plate is defined by spaced, opposing substantially parallel side edges 74 and 76 and spaced, opposing end edges 78 and 80. Side edges 74 and 76 together with end edges 78 and 80 define a substantially rectangular shape of flat plate 68.

Projecting outwardly from the front surface 70 is a latching member 82 defined by a pair of spaced, latching teeth 84 and 86, each having an inclined outer surface. The latching teeth are adapted to engage a latch of a complementary connector (not shown) in snap-action fashion to secure each of the latching blocks 16 to such complementary connector. Each latching block 16 may further include a pair of substantially parallel, spaced ledges 88 and 90 projecting from the front surface 70, each ledge 88, 90 serving as guide members in the attachment to a complementary connector.

Projecting rearwardly from the rear surface 72 of each latching block 16 is a pair of keying elements 92 and 94 that are formed to lie within the periphery of the flat plate 68. Each latching element 92, 94 is respectively formed to have a keying surface 96, 98, such keying surfaces being configured for cooperative engagement with the recesses 40 and 42 in the mounting wall 32 of the insulator body 22. In the preferred arrangement, the keying surfaces 96 and 98 are formed to be non-linear and are generally of semi-circular, curved shape. Adjacent the respective upper and lower end edges 78 and 80, each keying element includes a substantially flat surface 100, 102 that are within the respective end edges

78 and 80 and are substantially parallel thereto. As illustrated in Figure 4, the keying elements 92 and 94 lie adjacent the end edges 78 and 80 and the centers of the keying elements lie in a plane 104 that is substantially parallel to the side edges 74 and 76.

As seen in Figure 3, a bushing 106 of generally cylindrical outer configuration projects outwardly from the rear surface 72 of each latching block 16. As seen further by reference to Figure 5, the bushing 106 includes an internally threaded aperture 108 that opens through the front surface 70 and the rear surface 72. At its rearward distal end, bushing 106 includes a relatively thin wall 110 that is particularly configured for swaging in a peening process for attachment to the connector locking clip, as will be described hereinafter.

By further reference to Figure 4, bushing 106 has a central axis 112 that is substantially perpendicular to the flat plate 68. The axis 112, and thereby the bushing 106, is located closer to side edge 74, the axis 112 thereby being off-set laterally relative to the plane 104 of the latching elements 92 and 94. The off-set of the bushing 106 relative to the keying elements 92 and 94 is configured cooperatively with the off-set spacing of the mounting wall opening 44 and upper and lower recesses 40 and 42.

Turning now to Figures 6 and 7 the details of the locking clip 18 are more fully described. Each locking clip 18 is preferably formed of one-piece construction and is stamped and formed from sheet metal, such as phosphor bronze. Each clip 18 is of generally stepped-like shape comprising a generally flat central portion 114, a downwardly depending latching portion 116 and an upwardly extending securing portion 118. The latching portion 116 and the securing portion 118 project in opposite directions at either end of the central portion 114 and are thereby off-set in different vertical planes to define the stepped-like shape.

The securing portion 118 comprises a generally planar flange 120 having a generally circular opening 122 formed therethrough. Toward the bottom of the flange 120 and adjacent the central portion 114 there are formed a pair of opposed angled edges 124 and 126. Projecting outwardly from the flat central portion 114 from each side thereof is a bend-resistant element 128 and 130. Each bend resistant element extends obliquely upwardly relative to the flat central portion 114. Each bend resistant element 128, 130 includes a respective cantilevered extent 132 and 134, each being disposed closely adjacent to a respective angled edge 124 and 126 and intersecting the plane of planar flange 120. Each cantilevered extent terminates in end surfaces, 132a and 134a, that lie substantially flush with the outside surface 120a of the flange 120. The cantilevered extent end surfaces 132a and 134a are placed to engage the rear surface 32a of the mounting wall 32 (see Fig. 7) in use. Such engagement of the extent end surfaces 132a, 134a with the rear wall surface 32a provides resistance to bending of the central portion 114 relative

to the flange 120 during insertion of the clip into a printed circuit board to thereby minimize misalignment problems. Referring still to Figure 6, the latching portion in the preferred arrangement, comprises a pair of spaced, downwardly projecting legs 136, 138, each terminating in a curved end extent 140 and 142 for frictional, resilient retention in a printed circuit board.

As seen more fully in Figure 7, the base 46 of the insulator 12, as seen from a rearward direction, has an open faced slot defining the opening 48. The base 46 further includes a cradle 144 having a pair of spaced, angled surfaces 146 and 148 upon which the obliquely extending bend resistant elements 128 and 130 are respectively seated. The locking clip 18 is adapted to be slid onto the cradle 144 with the clip legs 136, 138 extending through the open faced slot 48 upon assembly as will be described, with the curved end extents 140, 142 of the clip extending beneath the lower surface of the base 46 in assembly. The surface 120a of the clip flange 120, as well as the end surfaces 132a and 134a of the cantilevered extents are preferably placed against the rear surface 32a of the mounting wall when the clip 18 is fully seated in the cradle 144, although such end surfaces 132a and 134a may be slightly spaced therefrom.

Having described the details of the constituent components of the electrical connector 10, the assembly thereof is now described. The conductive shell 14 is attached to the insulator 12 with the insulator nose portion 24 inserted into the shell nose portion 54. The rear surface of each of the shell flanges 52 is placed against a front surface of the respective mounting walls 32. As such, the shell recesses 62 and 64 are in substantial registry with the mounting wall recesses 40 and 42, respectively. Similarly, the shell opening 66 is aligned with the mounting wall opening 44. The electrical contacts 20 are suitably inserted from the rear surface of the insulator body 22 into the respective apertures 26, with the contact terminal pins 28 projecting in right angle disposition downwardly from the insulator body 22. Each locking clip 18 is slid onto the body base 46 with the latching portion received in the base slot 48, until the upstanding flange 120 lies against the rear surface 32a of each mounting wall 32. The opening 122 in each locking clip flange 120 is aligned in substantial registry with the mounting wall opening 44.

Each latching block 16 is assembled by inserting the rearwardly extending bushing 106 through the shell opening 66, through the mounting wall opening 44 and through the locking clip opening 122. During such insertion, the upper and lower keying elements 92 and 94 are received in the respective keyways 40 and 42. Due to the offset nature of the keying elements 92, 94 relative to the central axis of the bushing 106, and the cooperative offset arrangement of the recesses 40, 42 relative to the mounting wall opening 44, the latching blocks may be assembled to the connector in only one position. Thus, in this alignment, the latching member 82 has its

latching teeth 84, 86 facing outwardly toward each end of the connector. In addition to the desirable alignment, the keying elements and keyways further provide anti-rotation resistance of the latching blocks relative to the insulator 12. Furthermore, due to the offset,  $s$ , of the shell flanges 52 relative to the shell frame 50, the side edge 76 of each block 16 lies closely adjacent the frame, which further contributes anti-rotational resistance to the block. Moreover, since the keying elements 92, 94 are located within the periphery of the flat plate of each latching block, the dimensions of the ear portions of the connector may be kept to a minimum.

In this assembly, the rear surfaces 72 of each metal latching block lie against the front surface respectively 15 of each shell flange 52. The thin wall portion 110 of the bushing is then deformed in a conventional peening process whereby the thin wall portion is deformed outwardly and against the rear surface of the locking clip flange 120 in a manner to secure the latching block 16, 20 shell 14, insulator 12 and locking clip 18 together. As such, the locking clip is also in electrical engagement with the latching block and the conductive shell. Thus, electrical connection of the ground clip 18 to a conductive trace on a printed circuit board provides a grounding 25 path to the shell 14. Upon attachment of the connector 10 to a printed circuit board by way of the locking clips 18, bending of the clip 18 is resisted by the bend resistant elements as described hereinabove, thereby providing proper mounting and alignment of the connector on 30 a printed circuit board.

Having described the preferred embodiments of the invention herein, it should be appreciated that variations may be made thereto without departing from the contemplated scope of the invention. With respect to the latching block, for example, although two keying elements have been shown and described, other numbers of keying elements in different shapes and in different locations may be used. With respect to the locking clip, different configurations and numbers of the bend resistant elements may be used. Accordingly, the preferred embodiments described herein are intended to be illustrative rather than limiting. The true scope of the invention is set forth in the claims appended hereto.

## **Claims**

1. A shielded electrical connector (10) for mounting on a printed circuit board and for attachment to a complementary electrical connector, comprising:

an insulator (12) of insulative material including a body (22) and two spaced ear portions (30), each ear portion projecting outwardly from said body and comprising a mounting wall (32) having an opening therethrough (44) and a base (46), said body having a plurality of apertures therein supporting a respective plurality of elec-

- trical contacts;
- a conductive shell (14) supported on said insulator body and comprising two spaced flanges (52), each flange having a surface disposed adjacent a respective insulator mounting wall and having an opening (66) therethrough in substantial registry with a respective opening (44) in said insulator mounting wall (32);
- two one-piece, metal latching blocks (16) separate from said conductive shell (14) for attachment to a complementary electrical connector, each block (16) being disposed against a respective flange (52) of said shell, each block comprising a generally flat plate (68) having opposed surfaces (70,72), a latching member (82) projecting outwardly from one of said surfaces (70) and in a direction away from said shell flange (52), and a bushing (106) projecting from said opposite plate surface (72), said bushing extending through said opening (66) in said shell flange (52) and through said opening (44) in said ear portion mounting wall (32), said bushing (106) having an internally threaded aperture (108) opening through said surfaces of said flat plate (68), each said block (16) including a keying element (92) projecting toward a respective ear portion mounting wall (32) and being in engagement therewith, said keying element (92) aligning each block (16) relative to said shell flange (52) and providing anti-rotation resistance, said keying element (92) being spaced from said bushing (106) and lying within the periphery of said mounting wall (32); and two conductive locking clips (18) supported by said insulator bases, each clip having a securing portion (118) secured to a respective said bushing (106) and a resilient latching portion (116) projecting outwardly from said base for resilient mounting to an electrical circuit on a printed circuit board.
2. A connector according to claim 1, wherein each said keying element (92) comprises a keying surface (96) and wherein each said mounting wall (32) has a keyway (40) cooperatively configured to said keying surface (96) and in receipt thereof.
3. A connector according to claim 2, wherein one of said mounting wall openings (44) or said mounting wall keyways (40) is located closer to said insulator body (22) than the other of such openings or such keyways.
4. A connector according to claim 3, wherein each said mounting wall (32) comprises relative upper (34) and lower (36), spaced, substantially parallel edges and an outer edge joining said upper and lower edges, and wherein said keyway (40) is defined by a recess extending into one of said upper or lower edges.
5. A connector according to claim 4, wherein each said flange (52) on said conductive shell (14) comprises relative upper (56) and lower (58), spaced, substantially parallel edges disposed adjacent said upper and lower edges of said mounting wall, and wherein one of said upper or lower edges of said shell flanges has extending therein a recess (62) of shape complementary to said recess (40) of said mounting wall and disposed in substantial registry therewith.
6. A connector according to any one of Claims 1 to 5, wherein said conductive shell (14) comprises a generally flat frame (50) disposed adjacent said insulator body, said respective flanges (52) of said shell being substantially parallel to said frame (50) and offset relative thereto toward said respective mounting walls (32).
7. A one-piece, metal latching block (16) for use with a separate latching block on an electrical connector for attachment to a complementary electrical connector, comprising:
- a generally flat plate (68) having opposed surfaces (70,72),  
 a latching member (82) projecting outwardly from one of said surfaces (70),  
 a bushing (106) projecting outwardly from said opposite surface (72), said bushing (106) having an internally threaded aperture (108) opening through said surfaces of said flat plate (68); at least one keying element (92,94) projecting outwardly from said opposite surface (72) and being spaced from said bushing (106), such keying element comprising a keying surface (96,98) lying within the periphery of said flat plate (68).
8. A block according to claim 7, wherein said keying (96,98) surface is non-linear.
9. A block according to Claim 7 or Claim 8, wherein said plate (68) comprises oppositely spaced, substantially parallel side edges (74,76), and oppositely spaced, substantially parallel end edges (78,80), said side edges and said end edges defining a generally rectangular shape of said plate surfaces, said bushing (106) being disposed more closely to a side edge and said keying element being disposed more closely to an end edge.
10. A block according to claim 9, wherein said keying element (92) comprises a generally curved keying surface (96) and a generally flat outer surface, said outer surface being disposed adjacent to and within

an end edge of said plate and substantially parallel thereto.

11. A block according to Claim 9 or Claim 10, further comprising a second keying element (94) of like configuration to said keying element (92), said second keying element being disposed adjacent to said oppositely spaced end edge. 5
12. A block according to claim 11, wherein said bushing (106) is of generally cylindrical configuration having its central axis projecting substantially perpendicular to said plate, said second keying element (94) being aligned with said keying element (92) in a plane substantially parallel to said side edges, said plane being offset relative to said axis of said bushing. 10 15

#### Patentansprüche

1. Ein abgeschirmter elektrischer Verbinder (10) zur Montage auf einer Leiterplatte und zur Befestigung an einem komplementären elektrischen Verbinder, umfassend:

einen Isolator (12) aus isolierendem Werkstoff, einschließlich eines Rumpfes (22) und zweier auseinanderliegender Ohrabschnitte (30), wobei jeder Ohrabschnitt von dem Rumpf nach außen vorsteht und eine Montagewand (32) mit einer durch sie durchtretenden Öffnung (44) und eine Basis (46) aufweist und der Rumpf in sich mehrere eine entsprechende Vielzahl von elektrischen Kontakten haltende Öffnungen aufweist, eine auf dem Isolatorrumpf gehaltene leitende Wand (14) mit zwei auseinanderliegenden Flanschen (52), wobei jeder Flansch eine an einer entsprechenden Isolatormontagewand angeordnete Oberfläche und eine durch diese durchtretende Öffnung (66) in wesentlicher Deckung mit einer entsprechenden Öffnung (44) in der Isolatormontagewand (32) aufweist, zwei von der leitenden Wand (14) getrennte, einstükkige Einklemmblocks (16) aus Metall zur Befestigung an einem komplementären elektrischen Leiter, wobei jeder Block (16) an einem entsprechenden Flansch (52) der Wand anliegt, jeder Block eine im allgemeinen ebene Platte (68) mit zwei zueinander entgegengesetzten Oberflächen (70, 72), ein von einer dieser Oberflächen (70) nach außen und in einer Richtung weg von dem Wandflansch (52) vorstehendes Verriegelungsglied (82) und eine von der entgegengesetzten Plattenoberfläche (72) vorstehende Buchse (106) aufweist, die durch die Öffnung (66) in dem Wandflansch

(52) und durch die Öffnung (44) in dem Ohrabschnitt der Montagewand (32) durchtritt, wobei die Buchse (106) eine sich durch die Oberflächen der ebenen Platte (68) öffnende Innengewindebohrung (108) aufweist, jeder Block (16) ein Keilelement (92) enthält, das in Richtung auf einen entsprechenden Ohrabschnitt der Montagewand (32) vorsteht und mit diesem in Anlage steht, das Keilelement (92) jeden Block (16) gegenüber dem Wandflansch (52) ausrichtet und einen Widerstand gegenüber einer Drehung ausbildet, das Keilelement (92) in einem Abstand zu der Buchse (106) und innerhalb des Umfangs der Montagewand (32) liegt, und zwei von den Isolatorbasen gehaltene leitende Verriegelungsclips (18), wobei jeder Clip einen an einer entsprechenden Buchse (106) befestigten Befestigungsabschnitt (118) und einen federnden, von der Basis nach außen vorstehenden Verriegelungsabschnitt (116) aufweist zur federnden Montage an einer elektrischen Schaltung auf einer Leiterplatte.

2. Ein Verbinder nach Anspruch 1, wobei jedes Keilelement (92) eine Keiloberfläche (96) und jede Montagewand (32) eine Keilnut (40) aufweist, die zum Zusammenwirken mit der Keiloberfläche (96) und zu deren Aufnahme ausgebildet ist. 25
3. Ein Verbinder nach Anspruch 2, wobei eine der Montagewandöffnungen (44) oder -keilnuten (40) näher an dem Isolatorrumpf (22) als die andere dieser Öffnungen oder Keilnuten angeordnet ist. 30
4. Ein Verbinder nach Anspruch 3, wobei jede Montagewand (32) relative obere und untere, einen Abstand voneinander aufweisende und im wesentlichen parallele Kanten (34, 36) und eine an die oberen und unteren Kanten angrenzende Außenkante aufweist und die Keilnut (40) durch eine in eine der oberen oder unteren Kanten verlaufende Aussparung gebildet wird. 35 40
5. Ein Verbinder nach Anspruch 4, wobei jeder Flansch (52) auf der leitenden Wand (14) relative obere und untere, einen Abstand voneinander aufweisende, im wesentlichen parallele Kanten (56, 58) aufweist, die an den oberen und unteren Kanten der Montagewand angeordnet sind, und eine der oberen oder unteren Kanten der Wandflansche eine in diesen verlaufende Aussparung (62) von einer zu der Aussparung (40) der Montagewand komplementären Form aufweist und in wesentlicher Dekkung mit dieser angeordnet ist. 45 50
6. Ein Verbinder gemäß irgendeinem der Ansprüche 1 bis 5, wobei die leitende Wand (14) einen an dem Isolatorrumpf angeordneten, im allgemeinen ebe- 55

- nen Rahmen (50) aufweist, die entsprechenden Flansche (52) der Wand im wesentlichen parallel zu dem Rahmen (50) und gegenüber diesem in Richtung auf die entsprechenden Montagewände (32) versetzt sind.
7. Ein aus einem Stück bestehender Einklemmblock (16) aus Metall zur Verwendung mit einem getrennten Einklemmblock auf einem elektrischen Verbinder zur Befestigung an einem komplementären elektrischen Verbinder, umfassend:
- eine im allgemeinen ebene Platte (68) mit zueinander entgegengesetzten Oberflächen (70, 72),  
 ein von einer (70) der Oberflächen nach außen vorstehendes Einklemmglied (82),  
 eine von der anderen Oberfläche (72) nach außen vorstehende Buchse (106) mit einer Innen gewindebohrung (108), die sich durch die Oberflächen der ebenen Platte (68) öffnet, mindestens ein von der entgegengesetzten Oberfläche (72) nach außen vorstehendes und in einem Abstand von der Buchse (106) liegenden Keilelement (92, 94), das eine innerhalb des Umfangs der ebenen Platte (68) liegende Keiloberfläche (96, 98) aufweist.
8. Ein Block nach Anspruch 7, wobei die Keiloberfläche (96, 98) nichtlinear ist.
9. Ein Block nach Anspruch 7 oder Anspruch 8, wobei die Platte (68) zueinander entgegengesetzte, in einem Abstand voneinander liegende, im wesentlichen parallele Seitenkanten (74, 76) und zueinander entgegengesetzte, in einem Abstand voneinander liegende, im wesentlichen parallele Endkanten (78, 80) aufweist, die Seiten- und die Endkanten eine im allgemeinen rechteckförmige Gestalt der Plattenoberflächen umschließen und die Buchse (106) näher an einer Seitenkante und das Keilelement näher an einer Endkante angeordnet ist.
10. Ein Block nach Anspruch 9, wobei das Keilelement (92) eine im allgemeinen gewölbte Keiloberfläche (96) und eine im allgemeinen ebene Außenfläche aufweist, die an und innerhalb einer Endkante der Platte und im wesentlichen parallel zu dieser angeordnet ist.
11. Ein Block nach Anspruch 9 oder Anspruch 10, weiter mit einem zweiten Keilelement (94) von gleicher Ausgestaltung gegenüber dem Keilelement (92), wobei das zweite Keilelement an der gegenüberliegenden, in einem Abstand befindlichen Endkante angeordnet ist.
12. Ein Block nach Anspruch 11, wobei die Buchse (106) von allgemein zylinderförmiger Gestalt ist und ihre Zentralachse im wesentlichen senkrecht zu der Platte vorsteht, das zweite Keilelement (94) mit dem Keilelement (92) in einer Ebene im wesentlichen parallel zu den Seitenkanten ausgerichtet ist und die Ebene gegenüber der Achse der Buchse versetzt ist.
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- 10 Revendications
1. Connecteur électrique blindé (10) destiné à être monté sur une plaque de circuits imprimés et à être fixé à un connecteur électrique complémentaire, comprenant :
- un isolateur (12) en matière isolante comprenant un corps (22) et deux parties en oreilles (30) espacées, chaque partie en oreille faisant saillie vers l'extérieur à partir dudit corps et comprenant une paroi de montage (32) qui a une ouverture (44) qui la traverse, et une base (46), ledit corps comportant une pluralité d'orifices supportant respectivement une pluralité de contacts électriques ;  
 une enveloppe conductrice (14) supportée sur ledit corps d'isolateur et comprenant deux ailes (52) espacées, chaque aile ayant une surface disposée à proximité d'une paroi de montage respective de l'isolateur et ayant une ouverture (66) qui la traverse, sensiblement en coïncidence avec une ouverture (44) respective pratiquée dans ladite paroi de montage (32) de l'isolateur ;  
 deux blocs de verrouillage (16), métalliques, en une pièce, séparés de ladite enveloppe conductrice (14), destinés à être fixés à un connecteur électrique complémentaire, chaque bloc (16) étant disposé contre une aile (52) respective de ladite enveloppe, chaque bloc comprenant une plaque (68) globalement plate ayant des surfaces (70, 72) opposées, un organe de verrouillage (82) faisant saillie vers l'extérieur à partir d'une desdites surfaces (70) et dans une direction opposée à ladite aile (52) de l'enveloppe, et une traversée (106) faisant saillie depuis ladite surface (72) opposée de la plaque, ladite traversée s'étendant à travers ladite ouverture (66) pratiquée dans ladite aile (52) de l'enveloppe et à travers ladite ouverture (44) pratiquée dans ladite paroi de montage (32) de la partie en oreille, ladite traversée (106) ayant un orifice (108) fileté à l'intérieur, s'ouvrant à travers lesdites surfaces de ladite plaque (68) plate, chacun desdits blocs (16) comprenant un élément formant clavette (92) faisant saillie vers une paroi de montage (32) respective de la partie en oreille et étant en prise avec elle,
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- ledit élément formant clavette (92) alignant chaque bloc (16) par rapport à ladite aile (52) de l'enveloppe et fournissant une résistance anti-rotation, ledit élément formant clavette (92) étant espacé de ladite traversée (106) et se trouvant à l'intérieur de la périphérie de ladite paroi de montage (32) ; et
- deux attaches de blocage (18) conductrices supportées par lesdites bases de l'isolateur, chaque attache ayant une partie d'assujettissement (118) assujettie à ladite traversée (106) respective et une partie de verrouillage (116), souple, faisant saillie vers l'extérieur à partir de ladite base, en vue d'un raccordement souple à un circuit électrique d'une plaquette de circuits imprimés.
2. Connecteur selon la revendication 1, dans lequel chacun desdits éléments formant clavettes (92) comprend une surface de clavetage (96), et dans lequel chacune desdites parois de montage (32) a un logement de clavette (40) configuré de façon coopérative pour ladite surface de clavetage (96) et pour la recevoir.
3. Connecteur selon la revendication 2, dans lequel une desdites ouvertures (44) de paroi de montage ou un desdits logements de clavette (40) de paroi de montage est situé(e) plus près dudit corps (22) de l'isolateur que l'autre ouverture ou logement de clavette.
4. Connecteur selon la revendication 3, dans lequel chacune desdites parois de montage (32) comprend des bords relatifs supérieur (34) et inférieur (36), espacés, sensiblement parallèles et un bord extérieur réunissant lesdits bords supérieur et inférieur, et dans lequel ledit logement de clavette (40) est défini par un évidement s'étendant dans un desdits bords supérieur ou inférieur.
5. Connecteur selon la revendication 4, dans lequel chacune desdites ailes (52) de ladite enveloppe conductrice (14) comprend des bords relatifs supérieur (56) et inférieur (58), espacés, sensiblement parallèles, disposés à proximité desdits bords supérieur et inférieur de ladite paroi de montage, et dans lequel un desdits bords supérieur ou inférieur desdites ailes de l'enveloppe s'étend à l'intérieur d'un évidement (62) de forme complémentaire audit évidement (40) de ladite paroi de montage et est disposé sensiblement en coïncidence par rapport à lui.
6. Connecteur selon l'une quelconque des revendications 1 à 5, dans lequel ladite enveloppe conductrice (14) comprend un cadre (50) globalement plat disposé à proximité dudit corps de l'isolateur, lesdi-
- tes ailes (52) respectives de ladite enveloppe étant sensiblement parallèles audit cadre (50) et décalées par rapport à lui vers lesdites parois de montage (32) respectives.
7. Bloc de verrouillage (16) métallique, en une pièce, destiné à être utilisé avec un bloc de verrouillage séparé, sur un connecteur électrique, en vue d'être fixé à un connecteur électrique complémentaire, comprenant :
- une plaque (68) globalement plate ayant des surfaces (70, 72) opposées,
- un organe de verrouillage (82) faisant saillie vers l'extérieur à partir d'une desdites surfaces (70),
- une traversée (106) faisant saillie vers l'extérieur à partir de ladite surface (72) opposée, ladite traversée (106) ayant un orifice (108) fileté à l'intérieur s'ouvrant à travers lesdites surfaces de ladite plaque (68) plate ;
- au moins un élément formant clavette (92, 94) faisant saillie vers l'extérieur à partir de ladite surface (72) opposée, et étant espacé de ladite traversée (106), cet élément formant clavette comprenant une surface de clavetage (96, 98) se trouvant à l'intérieur de la périphérie de ladite plaque (68) plate.
8. Bloc selon la revendication 7, dans lequel ladite surface de clavetage (96, 98) est non linéaire.
9. Bloc selon la revendication 7 ou la revendication 8, dans lequel ladite plaque (68) comprend des bords latéraux (74, 76) espacés de manière opposée, sensiblement parallèles, et des bords d'extrémité (78, 80) espacés de manière opposée, sensiblement parallèles, lesdits bords latéraux et lesdits bords d'extrémité définissant une forme globalement rectangulaire desdites surfaces de plaque, ladite traversée (106) étant disposée plus près d'un bord latéral, et ledit élément formant clavette étant disposé plus près d'un bord d'extrémité.
10. Bloc selon la revendication 9, dans lequel ledit élément formant clavette (92) comprend une surface de clavetage (96) globalement incurvée et une surface extérieure globalement plate, ladite surface extérieure étant disposée à proximité et à l'intérieur d'un bord d'extrémité de ladite plaque et sensiblement parallèlement à lui.
11. Bloc selon la revendication 9 ou la revendication 10, comprenant en outre un deuxième élément formant clavette (94) de même configuration que l'élément formant clavette (92), ledit deuxième élément formant clavette étant disposé à proximité dudit bord d'extrémité espacé de manière opposée.

12. Bloc selon la revendication 11, dans lequel ladite traversée (106) a une configuration globalement cylindrique dont l'axe central fait saillie sensiblement perpendiculairement à ladite plaque, ledit deuxième élément formant clavette (94) étant aligné avec ledit élément formant clavette (92) dans un plan sensiblement parallèle auxdits bords latéraux, ledit plan étant décalé par rapport audit axe de ladite traversée.

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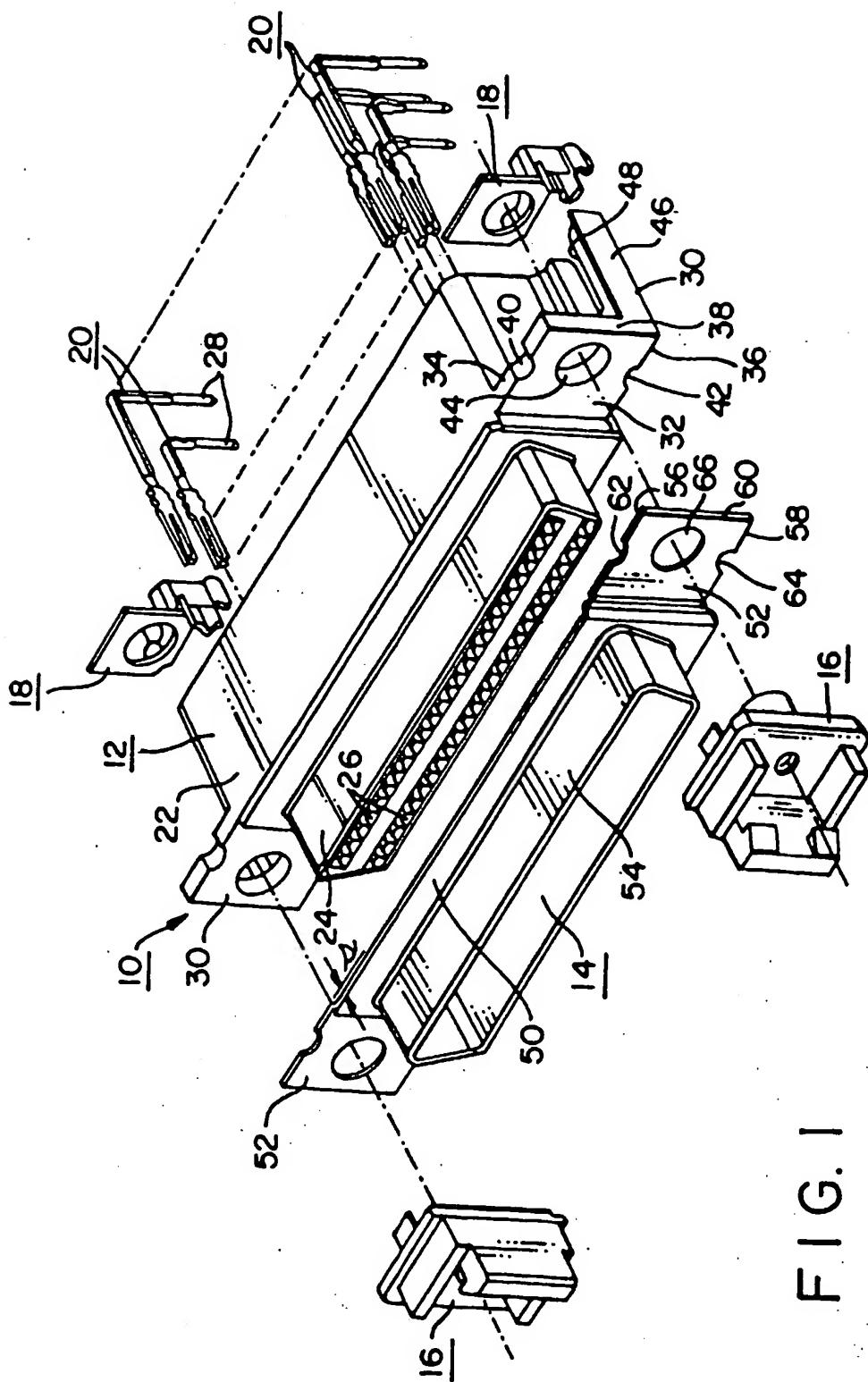


FIG. I

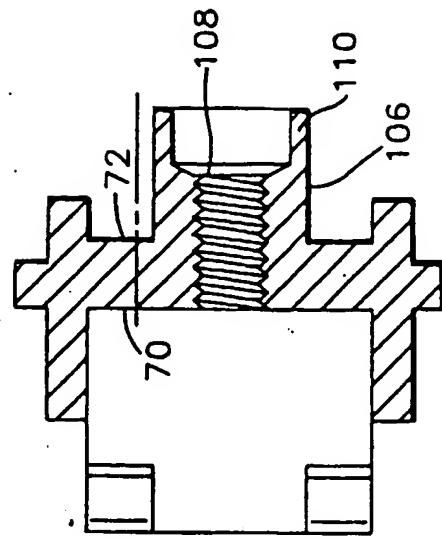


FIG. 5

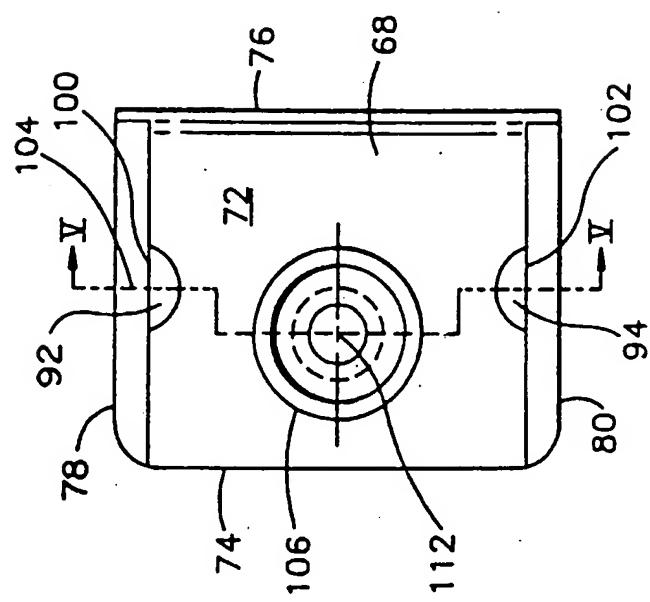


FIG. 4

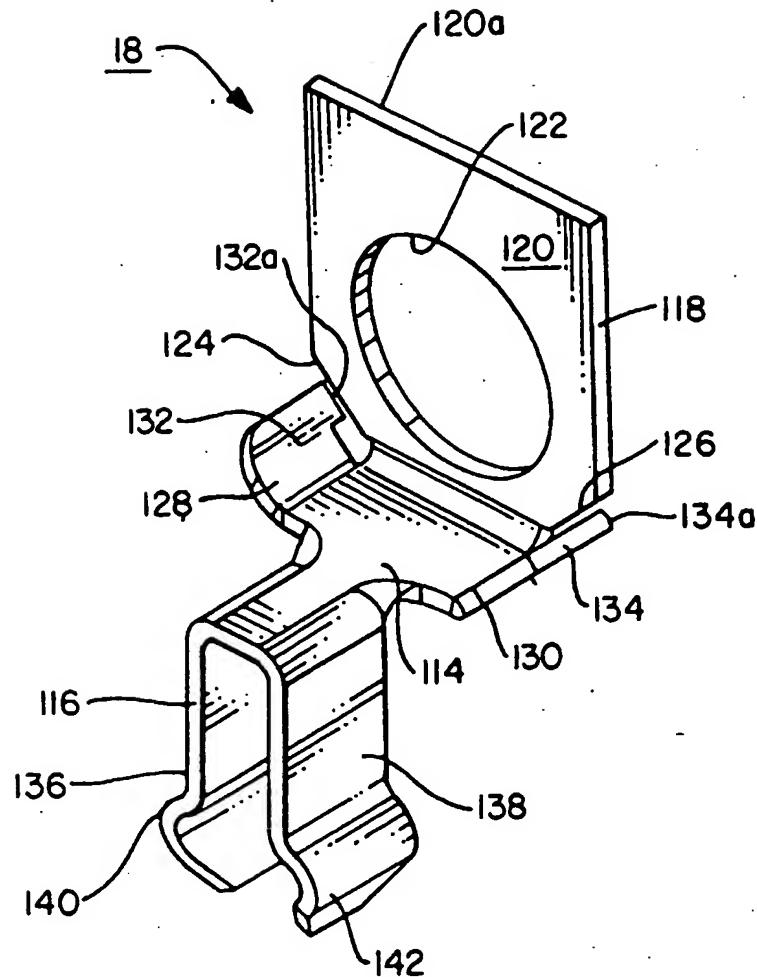


FIG. 6

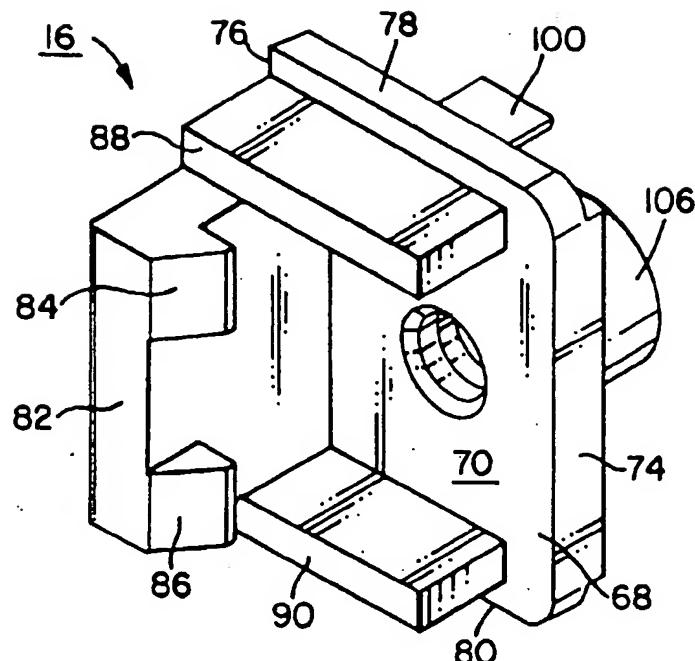


FIG. 2

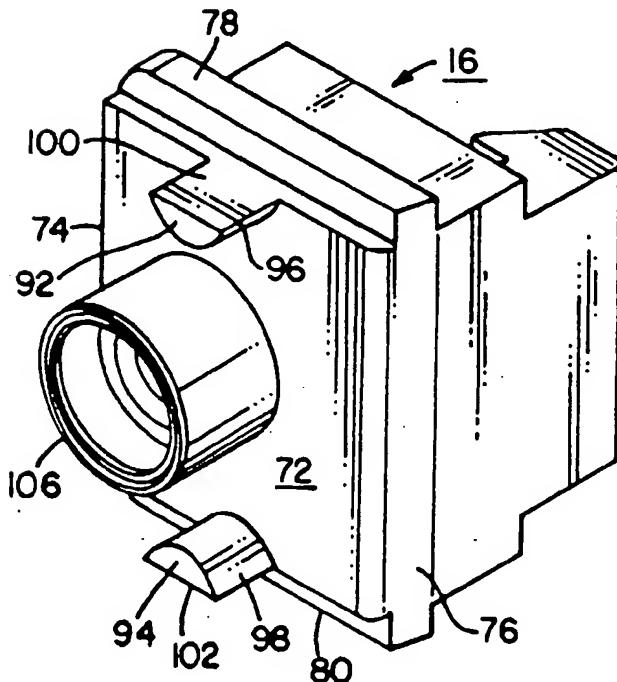


FIG. 3

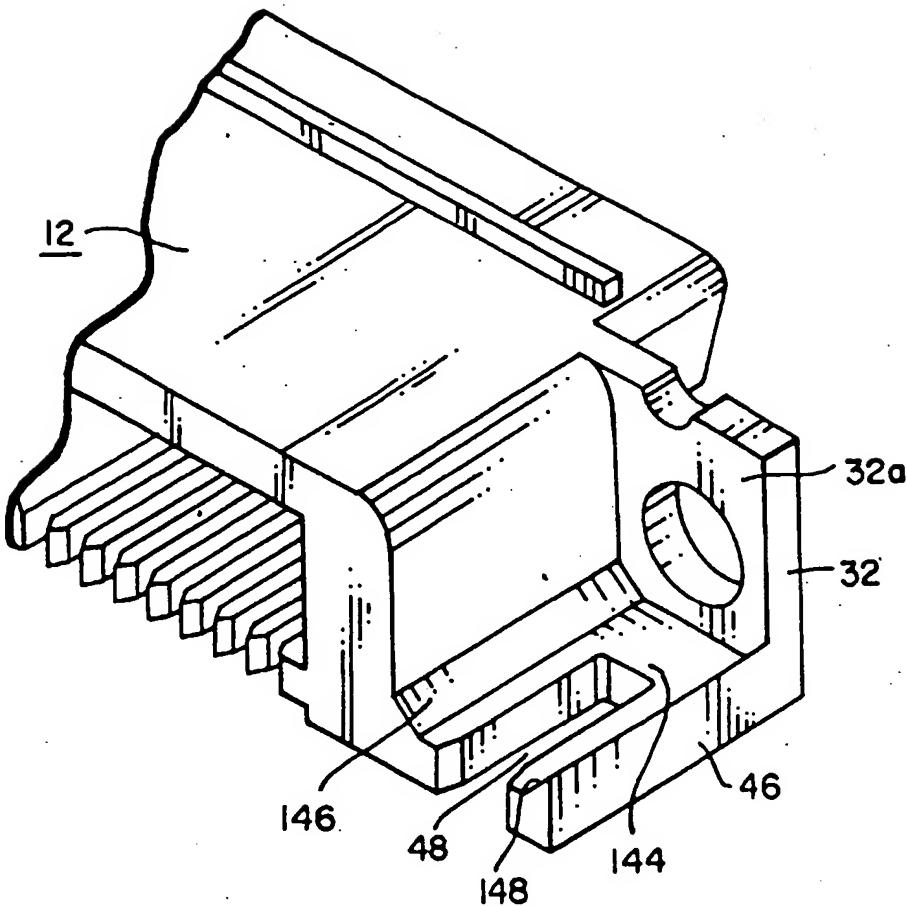


FIG. 7